

Claims

1. A valve opening/closing timing controlling apparatus,
5 comprising:

a housing member rotatable together with a drive member for transmitting a drive force;

10 a rotor member rotatably assembled with the housing member, a vane portion of the rotor member forming, within said housing member, a phase-advanced oil chamber and a phase-lagged oil chamber, the rotor member being rotatable together with a cam shaft;

a torsion coil spring for urging the rotor member relative to the housing member in a phase advancing direction; and

15 a hydraulic circuit for controlling feeding/discharging of work oil to or from said phase-advanced oil chamber or said phase-lagged oil chamber;

wherein said torsion coil spring has one end thereof fixed to said housing member and the other end thereof fixed to a projection provided on said rotor member.

20 2. The valve opening/closing timing controlling apparatus according to claim 1, the other end of the torsion coil spring is retained in a retaining groove defined in said projection of the rotor member.

25 3. The valve opening/closing timing controlling apparatus according to claim 2, wherein the other end of the torsion coil spring is clamped between the retaining groove provided in the rotor member and a positioning pin inserted in the retaining groove for positioning the rotor member relative to the cam shaft.

30 4. A valve opening/closing timing controlling apparatus

comprising:

- a housing member rotatable together with a drive member;
 - a rotor member rotatably assembled with the housing member, a vane portion of the rotor member forming, within said housing member, a phase-advanced oil chamber and a phase-lagged oil chamber, the rotor member being rotatable together with a cam shaft;
 - 5 a torsion coil spring for urging the rotor member relative to the housing member in a phase advancing direction; and
 - 10 a hydraulic circuit for controlling feeding/discharging of work oil to or from said phase-advanced oil chamber or said phase-lagged oil chamber; wherein said torsion coil spring has one end thereof fixed to said housing member and the other end thereof fixed to a recessed portion formed concave in a retaining groove formed in said rotor member.
- 15 5. The valve opening/closing timing controlling apparatus according to claim 4, wherein the other end of the torsion coil spring is clamped between the retaining groove and a positioning pin for positioning the rotor member relative to the cam shaft.